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inventors would have to take out three patents. The expense of a patent was greater in Ireland than in any other state in the world; and it arose not necessarily from the nature of the thing, but from the mode of paying certain public officers. This defect in the law of patents was a very great impediment in the way of inventors receiving the just reward of their exertions. It resulted from the supposition that patents were injurious to the community, and that the more they were restrained the better. He believed that they were most beneficial to the community, because they prevented inventive genius from being wasted away. In the absence of a system of patents inventors would be disposed to keep the fruits of their originality secret; and consequently they would be lost to the public. Therefore, he thought that a more perfect system of patents, by which every discovery would be secured to the community, and the just reward of his exertions insured to the discoverer, was much to be desired.

Dr. Madden read a paper containing an account of a proposal made in 1617 to apply magnetism as a means of communicating intelligence, by a method resembling the electric telegraph.

" The attention turned to the properties of the magnet, by our knowledge of the advantages derived from the mariner's compass, led to the first speculation on the possibility of the same agency being made a means of rapidly communicating intelligence between persons widely separated. The project in Latin poetry, of the magnetic telegraph, of the Jesuit Strada, conceived 233 years ago, was the precursor of the electric telegraph of our times. The application of the peculiar properties of the magnet to the purpose of navigation is claimed for a Neapolitan of the thirteenth century, of the town of Melfi, in the Terra di Lavaro. The first European navigator, however, who visited the Indian seas, had not to teach the Arab and

Chinese mariners the use of the compass. Osorius, in the first book of his ‘History of Portugal under Emanuel,’ gives a long account of the marine needle which Gama, in his first voyage, found in use at Mosambique (in 1498), in the Arab trading vessels which frequented the principal parts of that island. ‘These people,’ he says, ‘aided themselves then in their navigation with certain instruments which our pilots call marine needles.’ He then goes on describing the Arab compass, which in no very material respect seems to have differed from that now in use. At the end of this minute description, he adds:—‘These Arabs made use then of such needles and marine charts, by the means of which they knew with certainty the situation of maritime places according to the lines drawn on such charts. They observed also with quadrants the height of the sun, and the distances of places from the equinoctial line. In brief, they were so well furnished with everything necessary for navigation that the pilots of Portugal had hardly anything to teach them in the art of navigating.’ Humboldt, in one of the most recent of his publications, informs us that ‘More than a thousand years before our era, at the obscurely known epoch of Codrus, and the return of the Heraclides from the Peloponnesus, the Chinese already employed magnetic cards, on which the figure of a man, whose moveable outstretched arm pointed always to the south, guided them on their way across the vast grassy plains of Tartary; and in the third century of our era, at least seven hundred years before the introduction of the compass in the European seas, Chinese vessels navigated the Indian Ocean with needles pointing to the south.’* We read, in a work published in 1617, of a singular invention, very similar to that of the electric telegraph, described in some remarkable Latin verses said to have been recited by the celebrated Cardinal Bembo, at a festival got up in honour of the return to Rome of an illustrious personage, Hieronymus Alexander, previously to his investiture with the purple. The author of this work, the learned Jesuit Famiano Strada, filled the office of master of rhetoric in Rome for fifteen years. The work entitled 'Prolusiones Academicæ' was written while he filled that office in 1617. He died in the year 1649. The remarkable account of the uses to which the magnet might be turned occurs in the second book (p. 233 of the Oxford edition published in 1745). The discovery of those uses, and the verses descriptive of them, he attributes to Cardinal Bembo. The pageant where those verses were recited he states was performed before Leo X. The most celebrated poets of antiquity were represented in it by eminent Roman men of letters of that day, and their several styles were imitated in poetic pieces purporting to have been improvised on that occasion by Cardinal Bembo, Jovianus Strozzo, Naugerius, Parrhasius, Sadoletus, and Castilione. The pieces, however, are evidently the compositions of Strada. But it is to be observed, he narrates this exhibition and display of intellectual prowess as realities which had been communicated to him by his friend Alexander Burgius, to whom they had been related by Jerome Amaltheus, who had heard them from his intimate acquaintances, Bembo, Sadoletus, and Naugerius. Bembo, it may be observed, went to Rome, and became secretary to Leo X. in 1512, and died there in 1547, just seventy years before Strada published his Prolusiones. In the 115th and 21st numbers of 'The Guardian' there are two papers by Addison on critics and criticism, wherein he refers to the 'Prolusiones' of the learned Jesuit Strada, as 'one of the most entertaining, as well as the most just piece of criticism he ever read.' In those numbers he speaks of the pageant above referred to. 'It is commonly known,' he observes, 'that Pope Leo the Tenth was a great patron of learning, and used to be present at the performances, conversations, and disputes of all the most polite writers of his time. Upon this bottom Strada founds the following narrative.' The writer then describes the performances on the banks of the Tiber, near a villa of the Pope, on an artificial mount intended to represent Parnassus, and constructed so as to resemble a floating island in a lake. '*Strada,*' he continues, 'in the person of Lucretius, gives an account of a chimerical correspondence between two friends by the help of a certain loadstone, which had such a virtue in it that if it touched two needles, when one of the needles so touched began to move, the other, though at never so great a distance, moved at the same time and in the same manner.' He tells us that two friends, being each of them possessed of one of those needles, may make a kind of dial-plate, inscribing it with the four-and-twenty letters in the same manner as the hours of the day are marked upon the ordinary dial-plate, and they fix one of those needles on each of these plates, in such a manner that it could move round without impediment, so as to touch the four-and-twenty letters. Upon their separating from one another into distant countries, they may agree to withdraw themselves punctually into their closets at a certain hour of the day, and to converse by means of this their invention. Accordingly, when they are some hundred miles apart, each of them may shut himself up in his own closet at the time appointed, and immediately cast his eye upon the dial-plate. If he had a mind to write anything to his friend, he directed his needle to every letter that formed the words which he had occasion for, making a little pause at the end of every word or sentence, to avoid confusion. The friend in the meantime saw his own sympathetic needle moving of itself to every letter which that of his correspondent pointed at. By this means they talked together across the whole Continent, and conveyed their thoughts to one another in an instant over cities or mountains, seas or deserts.' *

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* Cosmos, page 169.

"But Addison does not profess to give a literal translation of those remarkable lines, and without that it is impossible to form an adequate idea of the import of some of them. The following version of them is rendered as faithful to the original as the abstruseness of some passages would admit of. And it is likewise well to remember that similar scholastic fooleries to those described by Strada were undoubtedly played at Rome in the presence of Leo the Tenth, and were shared in by several of those very eminent scholars whom Strada has introduced into his 'Prolusiones.' For convenience of reference the translator directs attention to the original Latin lines, beginning with the one—

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* Guardian, No. 119, vol. ii. pp. 213, 214.

'Magneti genus est lapidis mirabile,' &c.

'The nature of the magnet stone is wondrous; if to it you approach many particles of iron or iron styles (*stylos*) they not only derive from it a force and motion by which they ever strive to turn themselves towards the Great Bear constellation, where it shines near the pole, but also with a strange connexion and manner (of action) towards each other you will see as many styles as have touched that stone all jointly combine in one movement and one place; so that if perchance one of these be moved at Rome, the other at that movement, though it be far distant, turns itself by a secret bond of its nature. Now, then, if you wish your distant friend, to whom no letter can come, to know anything, take a disc (or dial), then write round the edge of it the letters of the alphabet, in the order in which children learn them, and in the centre place horizontally a rod which has touched the magnet, moveable so that it can touch whatever letter you wish. On the model of this you will make another disc, marked with a similar margin, and armed with an indicator of iron, which has received the movement of the magnet from that other iron. This disc let the friend about to depart take with him, and agree beforehand at what time, and on what days, he will examine whether the rod trembles, and what letters it points to with its index. These matters being thus arranged, if you desire privately to speak to the friend whom some shore of the earth holds far from you, lay your hand on the globe, turn the moveable iron—there you see disposed along the margin all the letters which are required for words; hither turn the indicator, and the letters, now this one, now that one, touch with the style, and whilst you are turning the iron through them again and again, you separately compose all the ideas in your mind. Wonderful to relate, the far-distant friend sees the voluble iron tremble without the touch of any person, and run now hither, now thither; conscious he bends over it, and marks the teaching of the rod, and follows reading here and there the letters which are put together into words; he perceives what is needed, and learns it by the teaching of the iron. And, moreover, when he sees the rod stand still, he, in his turn, if he thinks there is anything to be answered, in like manner, by touching the various letters, writes it back to his friend. Oh! may this mode of writing prove useful. Safer and quicker thus would a letter speed, nor have to encounter the snares of robbers or impediments of retarding rivers. A prince might do the whole business (of his correspondence) for himself with his own hands. We, children of scribes, emerging from the inky flood, would then hang up our pens in votive offering on the shores of the magnet.'—Bembo having thus concluded, we are told his verses were largely commended for the excellence of their imitation of the style of Lucretius, but for nothing more. Strada, no doubt, composed all the poems in his 'Prolusiones' that illustrated the styles of the different ancient poets who were represented on this occasion; but the question is, what foundation was there in fact for the subject of magnetic influence and its applicability to telegraphic purposes ever having been improvised on any occasion by Cardinal Bembo in presence of Leo X.? Is there any trace of this embryo of a great fact struggling into form before its time, any intuitive perception, however vaguely expressed, of the possibility of its being, to be found in the writings of this eminent man? It matters little, however, whether Strada or Bembo originated the idea. There is a sufficiently long interval between the times of either and our own, to make a marvel of the conception even of the possible accomplishment of a mighty plan for conveying thoughts, with the rapidity of lightning, thousands of miles over extensive regions, by an agent intangible and subtle, rendered manageable by a simple mechanism that could be put in the hands even of a mere child. The interval might have been longer than two centuries between Strada's idea and the realization of it by Lomond, had Galvani's experiments not led to an enlarged knowledge of electricity, and to a reasonable conjecture that magnetism was a subordinate form of electricity, as well as light and heat. Strada's conception of the feasibility of employing the agency of magnetism for the transmission of intelligence could hardly fail to be suggestive of similar projects and appliances; and these we find practically carried into execution in the construction of the first electric telegraph we have any account of,—that of a French mechanic, made in Paris about sixty years ago. I find an account of this first practical application of electricity to telegraphic purposes noticed in Mr. Arthur Young's Travels in France, in the years 1787, 1788, and 1789. At page 135 of the first volume, in referring to the various scientific inventions he had seen in France, he observes:—'Many of the discoveries that have enlarged the bounds of science have been the result of means seemingly inadequate to the end,—the energetic exertions of ardent minds bursting from obscurity, and breaking the bonds inflicted by poverty, perhaps by distress. I visited (at Paris) M. Lomond, a very ingenious mechanic, who has made an improvement of the jenny for spinning cotton. . . . In electricity M. Lomond has made a remarkable discovery: you write two or three words on a paper, he takes it with him into a room, and turns a machine enclosed in a cylindrical case, at the top of which is an electrometer, a small, fine pith ball. A wire connects a similar cylinder and electrometer in a distant apartment, and his wife, by remarking the corresponding motions of the ball, writes down the words they indicate, from which it appears that he has formed an alphabet of motions. As the length of the wire makes no difference in the effect, a correspondence might be carried on to any distance—within or without a besieged town, for instance—or for a purpose much more worthy, and a thousand times more harmless,—between two lovers prohibited or prevented from any letter connexion.'* It is more surprising that such a long interval should have been between the project of Strada and the practical realization of its aims, than that the powers of electricity should have been ascertained to be applicable to telegraphic purposes, whereof that surprising agent, magnetism, had been reasonably conjectured to be a subordinate form, as well as light and heat, and the action of the brain itself a modification of the same intangible and imponderable element. 'If mental action,' says the author of the Vestiges of the Creation, 'is electric, the proverbial quickness of thought, that is, the quickness of the transmission of sensation and will, has been brought to an exact measurement. The speed of light is about 192,000 miles per second. The experiments of Professor Wheatstone have shown that the electric agent travels, if I may so speak, at the same rate, thus showing a likelihood that all the imponderable bodies are ruled by one law of movement.'—(Sixth Ed. p. 294, notes.) It had not, however, been found out for upwards of a century and a half after Strada's death that 'simple electricity may be artificially produced and sent along the nerves of a dead body, exciting muscular movement,' and that it was capable of being similarly transmitted along the wires connected with a galvanic battery, causing motions corresponding to the former movement. Galvani's first publication respecting his new discovery, 'De veribus Electricitatis in Motu Musculari Commentarius,' appeared in 1791. His death took place in 1798. The electric telegraph, in short, may be regarded as having its type in that wonderful corporeal mechanism which transcends all other miracles of nature, and it may be considered as existing in embryo in Father Strada's poetical project of an apparatus for the rapid communication of our ideas by means of magnetic motions duly regulated and determined."

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* Young's Tour, vol. i. p. 79. 2nd edition, 4to.